

## **REMARKS**

Claims 1-27 are pending. Claims 17-24 are withdrawn. Claims 1-16 and 25-27 are rejected.

Claims 1, 2, 5-16 are canceled without prejudice. Claim 1 is rewritten as new claim 28. Claim 2 is rewritten as new claim 29. Claim 6 is rewritten as new claim 30. Claim 11 is rewritten as new claim 31. Claims 12 and 16 are rewritten as new claim 32.

Claims 3, 4, and 25-27 are amended.

The rewritten and amended claims are fully supported in the specification and claims as filed, and thus introduce no new matter.

Applicants thank the Examiner for the courtesy of the August 11, 2009 telephone interview, noted in the August 13, 2009 Interview Summary. As required, Applicants state they discussed proposed amendments and arguments that address each of the pending rejections and the issues noted in the Interview Summary.

Applicants thus respectfully request reconsideration.

## **CLAIM REJECTIONS UNDER 35 U.S.C. §112**

Claims 1-10 are rejected under 35 U.S.C. §112 ¶2 as indefinite.

Independent claims 1, 2, and 6 are rewritten to define and clarify the Examiner's noted issues. New claims 28-30, replacing claims 1, 2, and 6 respectively, recite the genotypes, including the alleles, to be determined in the method, and the combination of genotypes that are used to determine an individual's propensity to a food allergy.

Amended claims 3 and 4 depend from new claim 29. Claims 5 and 7-10 are canceled without prejudice.

Applicants thus assert that the noted claims are sufficiently definite and respectfully request this rejection be withdrawn.

Claims 1 and 11-14 are rejected under 35 U.S.C. §112 ¶1 as not described. The Examiner states ...the claims at issue encompass the detection of additional polymorphic positions within IL-4R $\alpha$ , IL-13, or a CD14 or within undisclosed genes...

and

The specification does not disclose any structure or physical and/or chemical characteristic that would readily allow one skilled in the art to identify additional naturally occurring polymorphisms that are related to an increased likelihood of the presence of food allergies.

Independent claims 1 and 11 are rewritten as new claims 28 and 31, respectively. Dependent claim 12 is (with claim 16) rewritten as new claim 32.

Claims 28, 31, and 32 recite methods that require at least two genotypes corresponding to position 130 of the IL-13 polypeptide, and either position 75 of the IL-4R $\alpha$  polypeptide and/or position -159 in the promoter of the CD 14 gene.

Claims 28, 31, and 32 recite the genotype of both alleles in the IL-13 gene that results in QR at position 130 of the IL-13 polypeptide; the genotype of both alleles of the IL-4R $\alpha$  gene that results in VV at position 75 of the IL-4R $\alpha$  polypeptide; and both alleles at position -159 in the promoter of the CD 14 gene that are TT.

Dependent claims 12 and 14 are rewritten as new claim 32 and more completely describes the method. Dependent claim 13 is canceled without prejudice.

Applicants thus assert that no "additional polymorphic positions within IL-4R $\alpha$ , IL-13, or CD14 or within undisclosed genes" are recited, that the claims are described, and respectfully request this rejection be withdrawn.

Claims 1, 6, 7, 9-15, and 25-27 are rejected under 35 U.S.C. §112 ¶1 as not enabled.

Independent claims 1 and 6 are rewritten as new claims 28 and 30, respectively. Claims 7 and 9-15 are canceled.

Regarding claims 25-27, Applicants respectfully disagree.

The Examiner (Action pp. 8-9 at ¶13 A-D) states that the following genotypes are enabled for determining a propensity for a food allergy in an individual:

TT (-159 of CD14)

VVQR (position 75 of IL-4R $\alpha$  polypeptide and position 130 of IL-13 polypeptide)

QRTT (position 130 of IL-13 polypeptide and -159 of CD14)

VQT (position 75 of IL-4R $\alpha$  polypeptide, position 130 of IL-13 polypeptide, and -159 of CD14).

Applicants assert that the three locus combination of VVQRTT is also enabled, supported at least at p. 12 (emphasis added):

At the three-locus level, there were 8 individuals carrying the genotype of VV (I75V at IL-4R $\alpha$ )-QR (R130Q at IL-13)-TT (CD14) in patients with food allergy, and 0 in normal controls (p = 0.054)

and p. 22 (emphasis added):

the specific combination VV (I75V)-RQ (IL13 R130Q)-TT(-159C→T) is more common in peanut allergy patients, meaning the combination of these three markers associates with peanut allergy.

Applicants assert that the two-locus combination VVTT is also enabled for determining an individual's propensity to a milk allergy, supported at least at p. 22:

the combination of VV(I75V)-TT(-159C→T) again is more common among milk allergy patients.

To summarize:

Claim 25 recites the combination VVQRTT in a method of determining an individual's propensity to a peanut allergy; Applicants assert this is enabled, as described above.

Claim 26 recites the combination VVTT in a method of determining an individual's propensity to a milk allergy; Applicants assert this is enabled, as described above.

Claim 27 recites the genotype TT at position -159 of the CD 14 promoter in a method of determining an individual's propensity to a food allergy; the Examiner states this is enabled.

Claim 28 recites at least one of combination VVQR or QRTT in a method of determining an individual's propensity to a food allergy; the Examiner states this is enabled.

Claim 30 recites at least one of combination VVQR or QRTT in a method of determining an individual's propensity to a food allergy; the Examiner states this is enabled.

Claims 31 and 32 recite methods using a two-locus and three-locus determination, respectively. The two-loci are VVQR and QRTT; the Examiner states both are enabled. The three loci are VVQRTT; Applicants assert these are enabled, as described above.

For at least these reasons, Applicants respectfully assert that claims 25-27 are enabled, as are claims 28 and 30-32, and respectfully request this rejection be withdrawn.

#### **CLAIMS REJECTIONS UNDER 35 U.S.C. §102**

Claim 1 is rejected under 35 U.S.C. §102(b) as anticipated by Assa'ad. Claim 1 has been rewritten as new claim 28, and Applicants respectfully disagree it is anticipated.

Claims 28 recites a combination of genotypes that are used to determine an individual's propensity to a food allergy.

In contrast, Assa'ad, a co-inventor on the pending application, discloses determining a genotype at only one locus in IL-13. For example, Assa'ad's title is "Analysis of the R130Q IL-13 Polymorphism in Patients with Food Allergy" (emphasis added).

Because Assa'ad does not disclose determining a genotype at more than one locus, Assa'ad does not anticipate claim 28.

Claims 1, 5, 7, 8, and 10 are rejected under 35 U.S.C. §102(a) as anticipated by Woo. Claim 1 has been rewritten as new claim 28, and claims 5, 7, 8, and 10 are canceled. Applicants respectfully disagree claim 1 is anticipated.

Claims 28 recites a combination of genotypes which are used to determine an individual's propensity to a food allergy.

In contrast, Woo discloses determining a genotype at only one locus in CD14. For example, Woo's title is "The -159 C→T polymorphism of CD14 is associated with nonatopic asthma and food allergy" (emphasis added).

Because Woo does not disclose determining a genotype at more than one locus, Woo does not anticipate claim 28.

Claims 11-13 are rejected under 35 U.S.C. §102(b) as anticipated by Howell. Claim 11 has been rewritten as new claim 31. Dependent claim 12 is (with claim 16) rewritten as new claim 32. Claim 13 has been canceled without prejudice.

Claims 31 and 32 recite methods comprising a two-locus and three-locus determination, respectively, with the two-locus combinations being VVQR and QRTT, and the three locus combination being VVQRTT. Applicants' method analyzes the combination of these recited polymorphisms (at least two loci in claim 31, and three loci in claim 32) to enhance determination of an individual's propensity to a food allergy.

In contrast, Howell discloses whether certain HLA class II genetic polymorphisms, specifically, polymorphisms at the DRB1, DQB1, and DPB1 loci, contribute to the development of peanut allergy. Howell simply analyzes a variety of polymorphisms at these DRB1, DQB1, and DPB1 loci to determine if the polymorphisms associate with peanut allergy. Howell does not disclose analysis of IL-13, IL-4R $\alpha$ , or CD 14, as claims 31 and 32 recite. Howell does not disclose using a combination of polymorphisms to enhance determination of an individual's propensity to a food allergy. Howell does not disclose using at least a two-locus analysis, but instead uses a one-locus analysis multiple times.

Thus, Applicants respectfully assert that Howell does not anticipate claims 31 and 32.

For at least these reasons, and the Examiner's statement

Proposed amendments for overcoming the rejection of record were discussed. The examiner indicated that amendment to the claims to require analysis of more than one of IL-13 position 130, IL-4R alpha position 75 and CD14 promoter position -159 appear to overcome the art rejections of record (Interview Summary August 13, 2009),

Applicants believe each of the rejections under this section are overcome and respectfully request their withdrawal.

### **CLAIMS REJECTIONS UNDER 35 U.S.C. §103**

Claims 6, 11, and 13-15 are rejected under 35 U.S.C. §103(a) as obvious over Assa'ad in view of Woo.

Claim 6 has been rewritten as new claim 30. Claim 11 has been rewritten as new claim 31. Claims 13-15 have been canceled without prejudice.

Applicants respectfully disagree with the rejection, as analyzed below.

The Examiner states that Assa'ad teaches genotyping IL-13, and that the Q130 allele "may confer susceptibility to food allergy", and that Woo teaches genotyping the -159 C $\rightarrow$ T polymorphism in CD14, and that the TT genotype is associated with food allergy. The Examiner states

It would have been prima facie obvious to one of ordinary skill in the art to have determined the genotype of a single individual at both marker positions in order to provide a more complete means for profiling the individual for marker for food allergy [*sic*].

However, the Examiner acknowledges that "this technology area is highly unpredictable", and cites Applicants' specification as teaching

a given SNP may only be relevant in the context of a second or a combination of additional SNPs in the same gene or other genes ... a given SNP may have no effect individually or in combination with a different set of SNPs (p. 10, June 19, 2009 Action).

Thus, Applicants respectfully assert that the Examiner has acknowledged it is not obvious that multiple loci will "provide a more complete means of profiling the individual for marker for food allergy". For example, as Applicants' specification teaches and as the Examiner notes, the V (IL-4R $\alpha$ ), Q (IL-13), and T (CD14) allelic combination increases an individual's propensity to a food allergy, while the V (IL-4R $\alpha$ ), R (IL-13), and T (CD14) allelic combination does not increase an individual's propensity to a food allergy (specification p. 13). However, these loci in IL-4R $\alpha$ , IL-13, and CD14 have all individually been shown to associate with food allergy. Thus, a given genotype at one locus may only be relevant in the context of a genotype at another locus. Applicants respectfully assert that it is not obvious that a combination of genotypes, which have individually been associated with a phenotype, will result in an enhanced determination of a propensity to that phenotype, at least because of the unpredictability of the effects which various combinations of genotypes can have.

Thus, Applicants respectfully assert that Assa'ad in view of Woo does not render these claims obvious, at least for the following reasons. Assa'ad in view of Woo does not teach, suggest, or motivate, nor would a person of ordinary skill in the art predict, the genotype that results in R 130 Q of IL-13 and - 159 C $\rightarrow$ T of CD14 loci in combination, or determining the genotype that results in I 75 V of IL-4R $\alpha$ . Assa'ad in view of Woo does not teach, suggest, or motivate, nor would a person of ordinary skill in the art predict, the enhancement achieved in determining an individual's propensity to a food allergy based on at least a two-locus analysis comprising the recited genotype combinations. As analyzed above referencing both Applicants' specification and the Examiner's statements, Assa'ad in view of Woo do not teach, suggest, or motivate analyzing two loci, and thus does not does not teach, suggest, or motivate, nor render predictable, a two-locus analysis to determine an individual's propensity to a food allergy.

For at least these reasons, Applicants believe the rejections under this section are overcome and respectfully request their withdrawal.

## **CONCLUSION**

The application is believed to be in complete condition for allowance. No fees are believed due but, if deemed necessary, the Office is authorized to charge them to Deposit Account No. 20-0809.

The Examiner is invited to contact Applicants' undersigned representative with questions.

Respectfully submitted,  
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